Tamarack Allotment Biological Evaluation and Fisheries Specialist Report

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For:
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Location and Project Description

The proposed project is located in the Kahler Creek-John Day River watershed (1707020401) and Wall Creek watershed (1707020208) of the Heppner Day Ranger District, Umatilla National Forest, T7S, R25E; T7S, R26E; T8S, R25E; and T8S, R26E, in Grant County and Wheeler County, Oregon. Named streams within this allotment include: West Bologna Canyon, Ives Creek, Haystack Creek, Tamarack Creek, Whiskey Creek, Burnt Cabin Creek, South Fork Big Wall Creek, Dark Canyon, Lost Canyon, and Keating Creek.

Scale of Analysis

Tamarack Cattle Allotment Project activities occur in the Kahler Creek-John Day River watershed (within the Upper Kahler Creek subwatershed 170702040103, Haystack Creek-John Day River subwatershed 17072040105, and Bologna Canyon subwatershed 170702040101) and the Wall Creek watershed (within the Upper Big Wall Creek subwatershed 170702020805) (Table 1 and Map 1). A description of the Upper Kahler Creek subwatershed, Upper Big Wall Creek subwatershed, and Bologna Creek subwatershed are found in the Tamarack, Hardman, Little Wall and Monument Livestock Grazing Allotments Biological Assessment (Moreau 2013) on file at the Heppner Ranger District and will not be repeated here.

Table 1. Subwatershed acreage

Subwatershed	Acres	Acres in Allotment
Bologna Canyon170702040101	16,143	3,063
Haystack Creek-John Day River 17072040105	28,999	1,789
Upper Big Wall Creek 170702020805	15,916	9,060
Upper Kahler Creek 170702040103	19,608	5,540

Purpose and Need

The purpose of this project is to comply with the Rescission Act of 1995 (*Public Law 104-19, Section 504)* requiring NEPA analysis on the Tamarack Cattle Allotment. The intent is to incorporate and implement the goals and objectives of the Forest Plan and all subsequent Forest Plan amendments.

The purpose and need as well as the three alternatives are described in detail in the Tamarack EA (FS, 2015). This action is needed on the Tamarack Cattle Allotment because existing laws, regulations, and policies direct the Forest Service to allow livestock grazing on National Forests.

Proposed Action

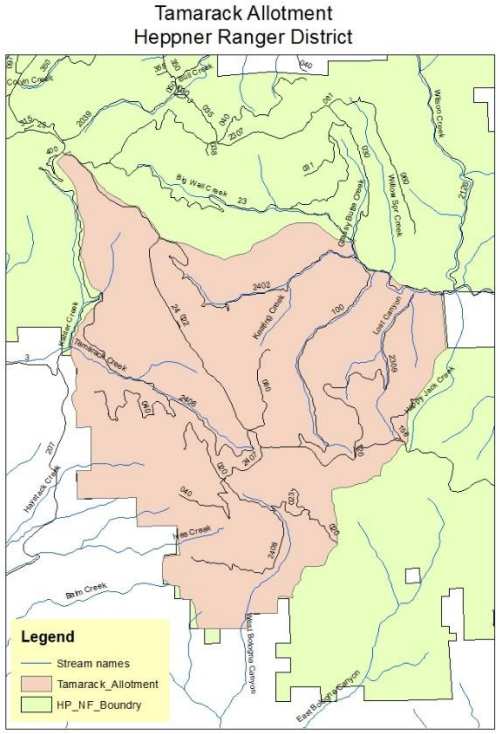
The proposed action would continue to authorize 209 cow/calf pairs from May 1st through September 15th using a deferred rotation grazing system on 19,441 acres in Wheeler and Grant Counties. Cattle would be rotated between pastures within the allotment during the grazing season (Table 2). Under Alternative 1 livestock would no longer be authorized within the project area and the allotment would be vacated. Alternative 2 would authorized continued grazing with no added spring resources or additional fencing. Alternative 3 would authorized continued grazing but there would be additional water source developments to improve the distribution of livestock in the allotment as well additional fencing to protect riparian areas.

As described in the hydrology report, activities associated with the project alternatives that could detrimentally impact water quality and riparian areas include grazing, fence construction, use of motorized equipment for maintenance, and the addition of new water developments. Direct effects could occur to aquatic species from disturbance from cows in streams, and impacts to water quality and riparian areas could also impact aquatic species through direct and indirect effects.

Access by cattle to perennial streams is limited by fencing and topography (see Biological Assessment Moreau 2013). This analysis tiers to the hydrology report and 2013 BA.

Table 2. Tamarack Allotment Pastures

Pasture	Number of Acres in Pasture	Days Livestock Spend in Pasture[1]	Number of Head Months Spent in the Pasture
Wildhorse	8,873	80	557
Little Tamarack	4,155	70	487
Stalling Butte	6,217	60	418
Wall Riparian	126	10	15



Map 1. Tamarack Allotment Heppner Ranger District, Umatilla National Forest

[1] The number of days in each unit and the pasture rotation varies annually depending on annual changes in conditions and utilization levels as related to desired conditions.

Federally Listed Threatened, Endangered and/or Proposed Species

Programs and activities on the Umatilla National Forest are reviewed to determine how they may affect any species listed under the Endangered Species Act (ESA) and the Regional Forester's Special Status Species List (as required under the National Forest Management Act). National Forest Service policy for any ESA or Regional Forester's listed species is stated in FSM 2670 and the U.S. Department of Agriculture Regulation 9500-4.

The Endangered Species Act (ESA) requires federal agencies to ensure that actions authorized, funded or carried out by them are not likely to jeopardize the continued existence of listed or proposed species, or result in the destruction or adverse modification of their critical habitats (ESA Section 7). The Forest Service has established direction in Forest Service Manual 2670 to guide the management of habitat for threatened, endangered, and sensitive species. Habitats and activities for threatened and endangered species on National Forest System lands are to be managed to achieve recovery objectives such that special protections under the ESA are no longer necessary (FSM 2670.21).

The primary objectives of the Threatened, Endangered, and Sensitive Species Programs are to recover federally listed and proposed species and, for Sensitive species to ensure that actions do not contribute to a loss of viability, or cause a significant trend toward listing under the ESA. The effects of any action authorized, funded, or carried out by the Forest Service on a Federally listed, Federally Proposed, or Sensitive species is analyzed in a Biological Evaluation (Region Six Letter of Direction "Update of the Regional Forester's Special Status Species List" July 2015, on file Heppner RD).

Management Indicator Species

Management Indicator Species (MIS) are defined in the Umatilla Land and Resource Management Plan (1990) "A species selected because its welfare is presumed to be an indicator of the welfare of other species using the same habitat…" Habitat conditions in the forest are managed for MIS species. Middle Columbia River steelhead and redband trout are both Forest management indicator species (MIS) and are present in the Tamarack Allotment. Redband have been observed in the same locations as MCR steelhead (e.g. Big Wall, South Fork Big Wall, and Dark Canyon Creeks) (Maps 2 and 3 and Table 3).

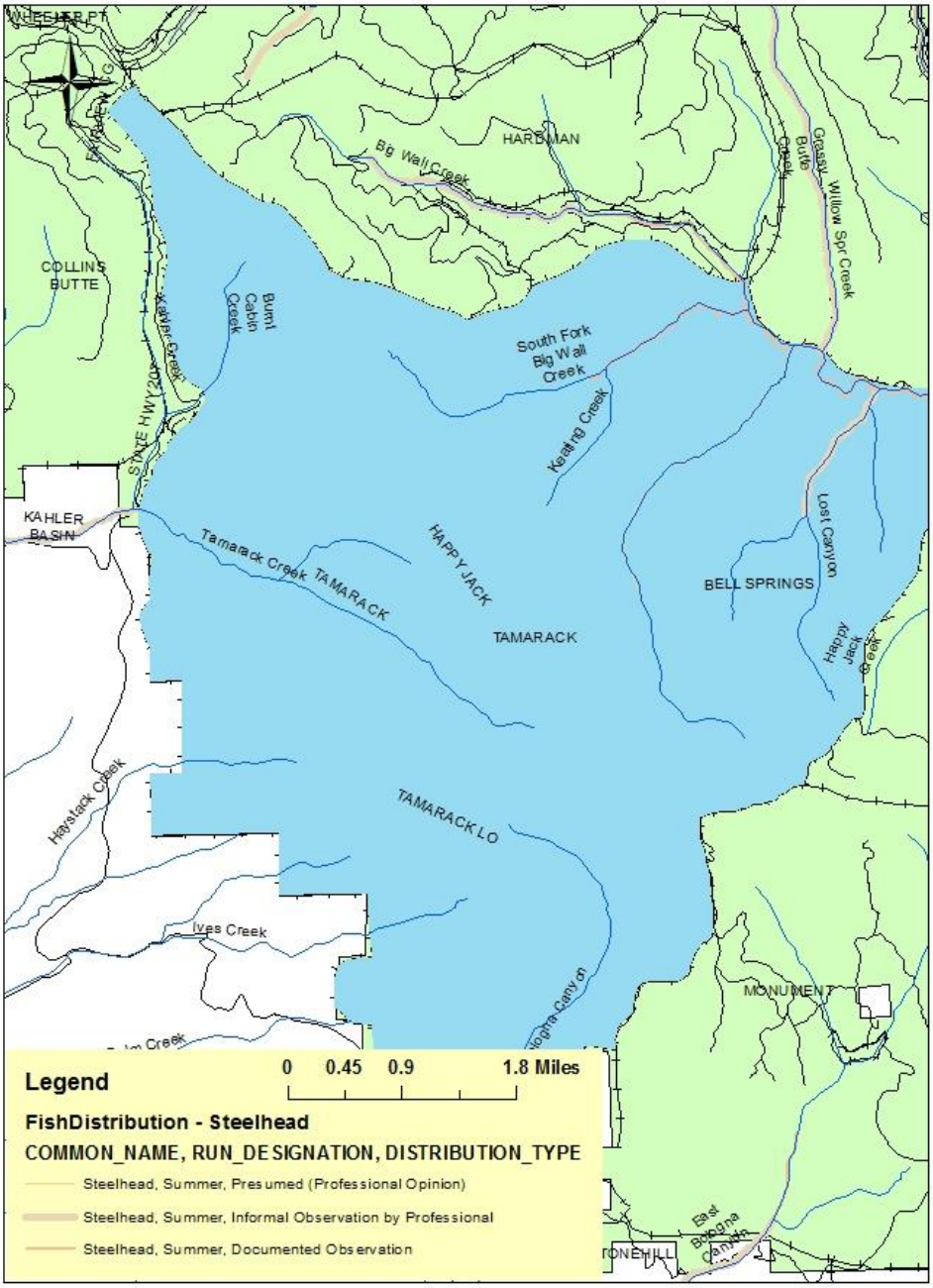
Table 3. Miles of MCR Steelhead Designated Critical Habitat (DCH) in the Tamarack Allotment Area and spawning and rearing habitat by total stream miles

Subwatershed & Stream Name	Total Stream Miles	DCH (Miles in Allotment)	Spawning & Rearing (Miles)
Upper Kahler Tamarack Creek	3.69	0	0.0

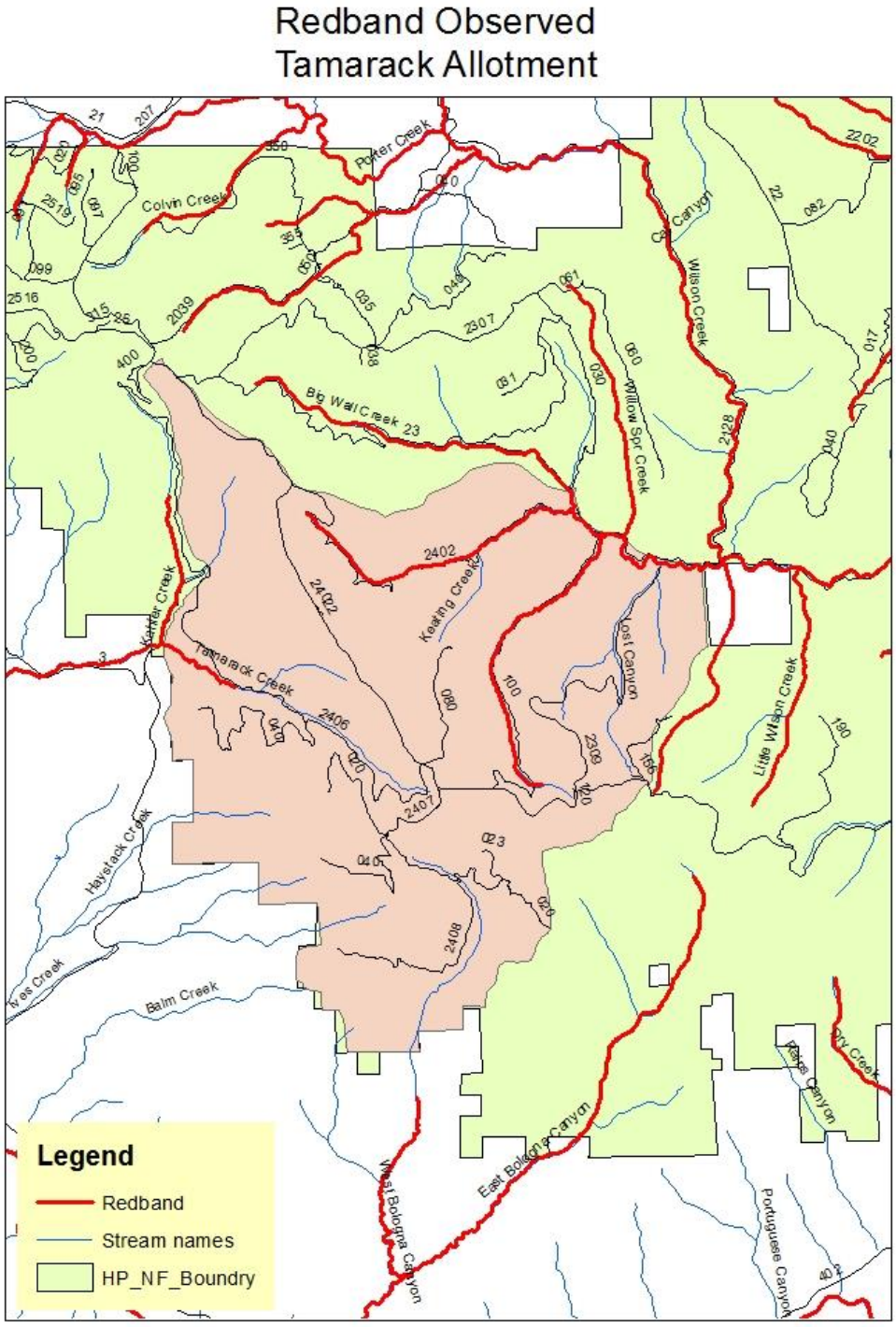
Subwatershed & Stream Name	Total Stream Miles	DCH (Miles in Allotment)	Spawning & Rearing (Miles)
Upper Big Wall			
S.F. Big Wall Creek	3.38	0.72	1.43
Dark Canyon Creek	4.2	2.65	2.48
Lost Canyon	2.0	0	1.0

Fish Distribution and Habitat

Middle Columbia River (MCR) steelhead and their Designated Critical Habitat (DCH) are the only species and habitat listed under the Endangered Species Act (ESA), which are found in the allotment area (Map 2). In 2016 spawning was observed in Lost Canyon where two redds were identified, however; this is the first year that redds have not been found in Dark Canyon Creek or South Fork Big Wall Creek (pers. comm. Tom Fritz 5/11/2016). No redds have ever been found in Tamarack Creek due to a box culvert under Highway 207 that acts as a fish barrier (T. Fritz 2016). Maps do not reflect the 2016 Lost Canyon survey information.



Map 2. Middle Columbia steelhead DCH and observed presence



Map 3. Management Indicator Species Redband Locations in Tamarack Allotment

Middle Columbia River Steelhead and their Critical Habitat

Steelhead are the anadromous form of rainbow trout, a salmonid species native to western North America and the Pacific Coast of Asia. Redband trout are another name for native resident rainbow trout in the Interior Columbia River Basin and are indistinguishable visually or genetically from its anadromous form as juveniles. MCR Steelhead rear in freshwater streams, where they reside for their first 1 to 3 years prior to smolting. They then migrate to the ocean where they can spend up to 3 years before returning to their native freshwater stream to spawn. Unlike Pacific salmon, steelhead are iteroparous, meaning they do not necessarily die after spawning and are able to spawn more than once although this varies among runs.

Steelhead display two broad life history patterns typically called summer-run and winter-run. Steelhead spawning occurs between March and May. Prior to spawning, maturing adults hold in pools or in side channels to avoid high winter flows. Typically, they spawn in stream reaches with a moderate to high gradient. Fry typically emerge between April and June. Summer steelhead in the NFJD can rear in freshwater habitat up to 4 winters. Migration to the ocean typically occurs at age 2 for wild summer steelhead, while most hatchery smolts migrate at age 1 (Carmichael and Taylor, 2009). The North Fork John Day (NFJD) summer steelhead population is distinct, but part of the larger John Day River Major Population Group (MPG) within the Mid-Columbia Steelhead ESU. This population of steelhead occupies the highest elevation, and wettest area in the John Day basin.

According to the 2016 5-Year Review: Summary & Evaluation of Middle Columbia River Steelhead. Middle Columbia River Steelhead the John Day River Lower Mainstem Tributaries, North Fork John Day River and either the Middle Fork John Day River or John Day River Upper Mainstem populations should achieve at least viable status (NOAA 2016). There have been improvements in the viability ratings for some of the component populations, but the MCR Steelhead DPS is not currently meeting the viability criteria described in the Middle Columbia River Steelhead Recovery Plan (NOAA 2016). This analysis was based on population abundance/productivity and spatial structure/diversity. Abundance/productivity is based on adult spawner returns and smolt to adult ratios (SAR). Spatial structure/diversity is based on analysis of spatial extent or range of the population, genetic variation, spawner composition, population connectivity and major life history strategies. Although the NFJD summer steelhead population is rated as highly viable and meeting recovery goals, the John Day River MPG remains below viable status due to the "maintained" population status on the Lower John Day. Designated critical habitat for Middle Columbia River steelhead within the NFJD subbasin

includes all rivers and stream reaches accessible to steelhead below long-standing natural barriers (*Federal Register* Vol. 70 (170); September 2, 2005).

Regional Sensitive Species

A number of sensitive invertebrate and aquatic vertebrate species are known or suspected on the Umatilla National Forest, and their known or suspected presence in the Project area is described in Table 4. One Sensitive Species is the anadromous Pacific lamprey. Pacific lamprey have been documented in Granite Creek, a high-elevation tributary to the North Fork John Day River. Pacific lamprey are not documented in the analysis area, but are documented in the John Day River approximately 5.5 miles downstream. Additional species habitat requirements are on file.

Table 4. Regional Forester's List of Sensitive Invertebrate and Vertebrate Species Present or suspected on the Umatilla NF and the Heppner Ranger District

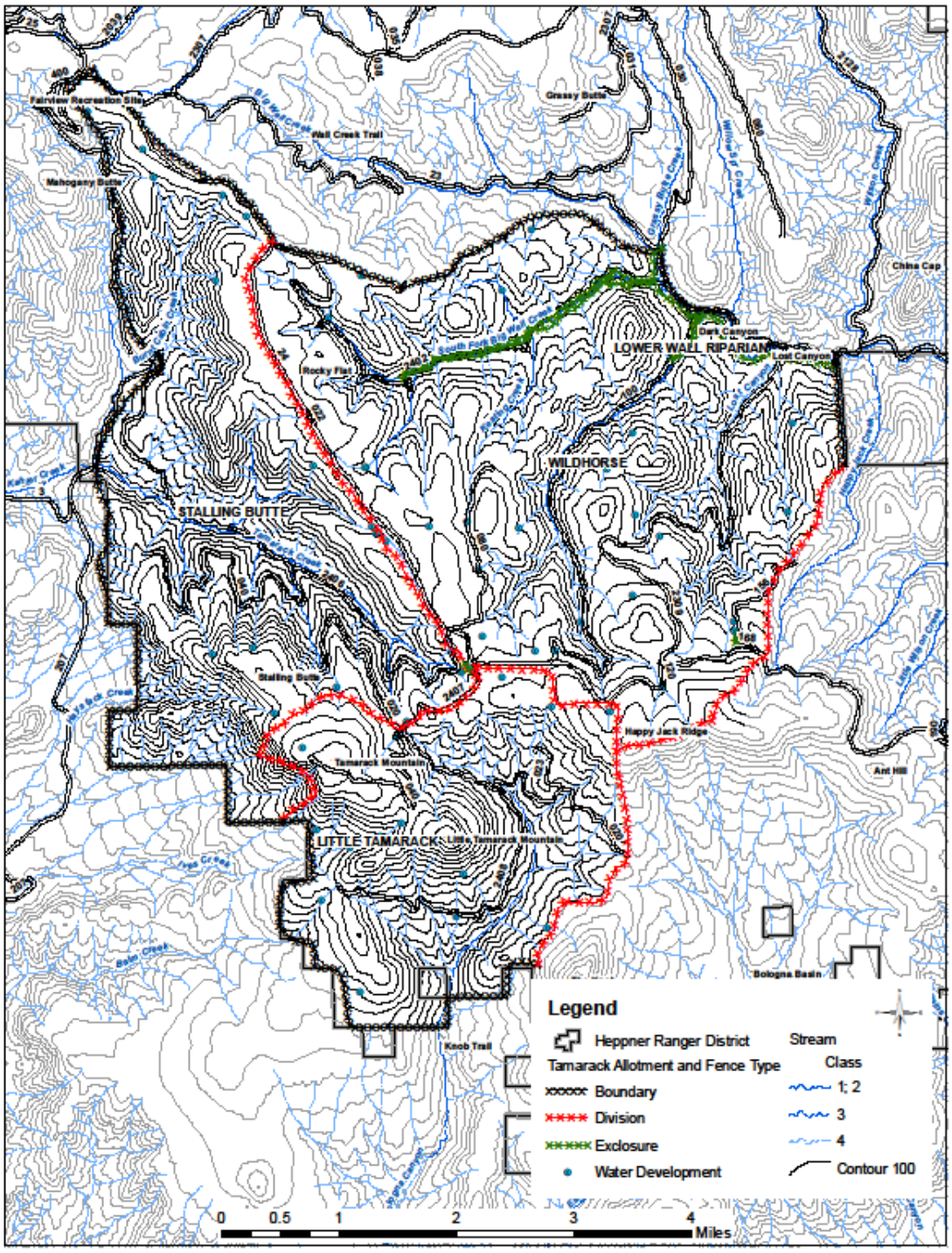
•..... egional Sensitive Invertebrate Species	• ..... abitat Description[2]	• ..... s Habitat Present in Analysis Area?	•..... s Species Present in Analysis Area?	• ..... urrent Known Distribution
•..... estern Ridged Mussel *(Gonidea angulata)*	• ..... ccur in streams of all sizes of low to mid-elevation watersheds. Common in stable stream reaches, tolerant of fine sediments and occupy depositional areas.	• ..... es	•..... bserved in lower Big Wall Cr. below the project area and present in lower Ditch Creek.	• ..... idely distributed west of the Continental Divide, CA to BC. It is mainly distributed east of the Cascades.
•..... hortface Lanx (Fisherola nuttalli)	• ..... ccurs in large low to mid-elevation riverine habitats. Common in unpolluted, cold, well oxygenated, perennial streams with cobble-boulder substrate.	• ..... o	•..... o	• ..... ound throughout the Snake River, Mid-Columbia basin limited to the Upper and Lower Deschutes, Lower John Day, Upper Columbia (Okanagan R.)
Columbia clubtail •..... Gomphus lynnae)	• ..... variety of river habitats, which can range from sandy or muddy or rocky, shallow rivers with occasional gravelly rapids. Water flow tends to be slow-moving.	• ..... uspected in the project area.	•..... uspected and assumed present in the analysis area.	• ..... akima River, Benton Co. John Day River, Wheeler and Grant Co. from Twickenham to Monument, Owyhee River, Malheur Co.

[2]Frest and Johannes 1995, Nedeau et al. 2009, Neitzel and Frest 1990, NatureServe Explorer 2009, Paulson 1999, Scheuering 2006, forest stream survey data (on file).

•..... egional Sensitive Invertebrate Species	• ..... abitat Description[2]	• ..... s Habitat Present in Analysis Area?	•..... s Species Present in Analysis Area?	• ..... urrent Known Distribution
Pacific Lamprey (Entosphenus tridentatus**)**	• ..... variety of river habitats, which range from sand, mud or rocky, shallow rivers with gravelly rapids.	• ..... o.	•..... o, the project is near known and suspected range.	• ..... ound from the Pacific Coast of North America and Asia.
Westslope Cutthroat Trout (Oncorhynchus clarkii lewisi)	• ..... old clear, water, high mountain streams with variable habitat complexity	• ..... o	•..... o, the project is outside the historic and suspected range	• ..... ound throughout the Mid-Columbia River Basin, NFJD and Upper John Day R. subbasins

Fences

There are approximately 44 miles of fencing in the Tamarack Allotment, and approximately six (6) miles of riparian areas have been fenced on the allotment to exclude cattle from streams. The streams fenced off from cattle are South Fork Big Wall Creek (approximately 2.3 miles), Big Wall Creek (approximately 1.94 miles), and Dark Canyon Creek (approximately 0.48 miles) (Map 4). Fencing has been strategically located to protect key resource values such as steelhead spawning habitat and improve resource conditions, and has facilitated the management of cattle on the allotment. A combination of fencing to control or eliminate access of cattle to riparian areas, upland water developments, and implementation and effectiveness monitoring are used to assure there are no adverse effects to ESA listed species and their DCH.



Map 4. Cattle fencing and exclosures in Tamarack Allotment

Issues Addressed in this Analysis

This fisheries and aquatic species analysis will tier to the key issues of water quality and riparian areas described in the hydrology report and identified

during project scoping. Water quality parameters that could be affected by cattle grazing include temperature, dissolved oxygen, pH and sediment. In addition, potential direct impacts from cattle grazing to spawning ESA listed MCR steelhead and redds and other aquatic species will be analyzed.

Resource Indicators

Resource indicators were chosen to determine potential impacts to the issues of water quality and riparian areas are described in the hydrology report and are summarized in this report. Potential impacts to spawning fish and/or redds are also discussed. The current number of cows grazing would not change under Alternative 2 and 3. Grazing would not occur under Alternative 1.

Methodology

The description that follows is derived from the 2013 Tamarack BA and the hydrology report used in this EA. It uses the format of the NMFS *Matrix of Pathways and Indicators* (MPI) described in *Making Endangered Species Act Determination of Effect for Individual or Grouped Actions at the Watershed Scale* (NMFS 1996). Stream surveys follow the Region 6 level II stream survey protocol (following a modified Hankin and Reeves 1988 protocol). Under the Section 7 Habitat Monitoring Protocol for the Upper Columbia River Basin (USDA 1994), PACFISH RMO's are intended to apply to Rosgen (1996) C-type channels. For example, monitoring protocol for determining pool frequency requires count of only pools greater than 1 meter (~3 feet) in low gradient (1% -2%) stream channels (Table 5).

Table 5. Calculated ICBEMP pool frequency values (McKinney et al. 1996)

Wetted Width (ft.)	Pools/mile[3]
0-5[4]	59
5-10	20
10-15	12
15-20	8.4
20-30	5.9
30-35	4.5
35-40	3.9
40-65	2.8
65-100	1.8

[3] To calculate the standard pools/mile using ICBEMP value of 0.028 for specific widths 147.8/channel width = standard pools/mile.

[4]Streams less than 5 feet wide, reaches would be expected to have a lower density of pools; however, there is no available way to calculate an appropriate value so standard would defer to the value of 39 pools per miles selected by the USFWS.

Existing conditions are also described in the hydrology analysis and inform the fish and aquatics report.
Habitat and watershed condition elements that may be affected by management of this allotment are temperature, sediment transport, width to depth ratios and streambank condition. Water quality, habitat quality, and the ability of the watershed and riparian areas to act as a buffer to grazing activity and its connected actions are components of aquatic habitat considered in this analysis. These habitat parameters are specifically addressed as PACFISH Riparian Management Objectives (RMO's) (referencing Section 7 Fish Habitat Monitoring Protocol for the Upper Columbia River Basin, USDA Forest Service, 1994), and are summarized in Tables 6 and 7. These objectives are part of determining the complexity of habitat available for fish within the analysis area.

Table 6. Pool Frequency

Habitat Feature	RMO's
Water Temperature	Compliance with Water Quality standard or maximum Temp. <68 ºF
Large Woody Debris	> 20 pieces/mile, >12 inch diameter, >35 ft. length
Bank Stability	>80 percent stable
Width/Depth Ratio	<10, mean wetted width divided by mean depth

Table 7. Riparian management objectives (RMOs) number of pools per mile by wetted width

Wetted Width (feet)	Number of Pools Desired under Riparian Management Objectives
10	96
20	56
25	47
50	26
75	23
100	18
125	14
150	12
200	9

Given the small wetted width of the majority of these stream channels and existing hydrograph (see hydrology report), percent side channel habitat is minimal in most of the stream reaches.

Upper Big Wall Creek Subwatershed (107702020805)

The headwaters of Dark Canyon, Lost Canyon, and South Fork Big Wall Creeks are located within the allotment boundary. Stream survey data (1994, 1993, and 2013 respectively) are available for these creeks. In R6 standard habitat and species distribution surveys have not been performed on all streams; however, a redd survey was conducted in area creeks. Big Wall Creek is MCR steelhead DCH and meanders along the northeast boundary of the allotment where steelhead have been observed. South Fork Big Wall and Dark Canyon Creeks are DCH for MCR steelhead. Dark Canyon Creek is DCH and was surveyed in 1994 where juvenile and adult fish were observed. South Fork Big Wall Creek was surveyed in 1994 and fish were also observed.

Upper Kahler Creek Subwatershed (107702040103)

The headwaters of Tamarack Creek are located within the allotment boundary. Stream survey data (1991 and 2013) are available for this creek. This creek is designated a Class I stream. No fish have been documented during biological stream surveys. No other subwatersheds in the Tamarack Allotment have streams with observed steelhead or DCH.

Riparian Management Objectives-Current Condition

Current status of PACFISH riparian management objectives for fish bearing streams in the analysis area are summarized in Table 8 below. A (+) indicates that a stream is meeting PACFISH objectives while a (-) indicates a stream is not meeting PACFISH RMOs. The specific stream reach data concerning these PACFISH habitat and watershed condition elements are located in the project file. Most recent stream survey data was used and RMOs values reflect an average of stream reaches sampled (Table 8).

Table 8. Current status of PACFISH riparian management objectives and trends for fish bearing streams in the analysis area

Stream	Temperature (° F)	Desired[5] Pools per mile according to riparian management objectives	ICBEMP Pools per mile	Bank Stability	Width-to-Depth ratio
Big Wall Creek (between Rd 2402 and forest boundary)	67-79	No data	<39	>80%	18-30
Big Wall Creek (PIBO EM integrator site	62	59			
Dark Canyon Creek	52-72	4.8	<39	<80%	10
Lost Canyon Creek[6]	No data	No data	No data	No data	No data
South Fork Big Wall Creek	No data	7.9	<39	<80%	9.7
Tamarack Creek	52-54.5	2.6	<39	>80%	<10

Temperature

Big Wall Creek is the only stream in the allotment where temperature monitoring data are available that most closely reflect ongoing management in the allotment and existing conditions reflective of historic impacts including very large floods in 1964, 1986, 1996. There are two temperature monitoring sites on Big Wall Creek, one of which was established specifically

[5] Many streams within the analysis area do not meet the minimum channel width requirements to calculate pool frequency PACFISH RMOs.

[6] No Data- data not available to indicate meeting PACFISH RMO.

to integrate effects of land management activities within and upstream of the allotment. That site was established for PACFISH/INFISH Biological Opinion Effectiveness monitoring, has been monitored every five years since 2003, and is located at the downstream edge of the Tamarack allotment within the Lower Wall Creek riparian pasture (see Table 9).

Table 9. Big Wall Creek-maximum weekly average maximum temperature (MWMT), downstream (east) edge of Tamarack allotment (170702020805) at PIBO Effectiveness Monitoring integrator site #1095 (164-17-I)[7]

Year	Temperature (° F) from PIBO MWMT data
2008	72
2009	61

Photos from the PACFISH/INFISH Effectiveness Monitoring Program website show improvement in riparian shrub recovery within this site between 2003 and 2013. The condition of riparian shrub cover in the reach provides increased stream shade and helps to explain the meaningful drop in water temperatures that met riparian management objective of 62 degrees Fahrenheit, or less, in 2013. This is the most recent temperature data available at that location, which is located within the Lower Wall Creek Riparian Pasture.

The second site, located at the forest boundary 4 miles downstream of the allotment in the Lower Wall Creek subwatershed (170702020806), has had continuous temperature monitoring since 1995. Temperature data from that site integrate habitat conditions throughout Big Wall Creek from that point upstream including management in the Tamarack allotment, but also integrate influences from other tributaries and allotments both up and downstream of Tamarack allotment, including Wilson Creek and Indian Creek, as well influence from a private land inholding on Big Wall Creek downstream of Tamarack allotment. Table 10 presents that long-term temperature monitoring record at the Forest boundary.

[7] PIBO unpublished data, on file. (http://fsweb.r4.fs.fed.us/unit/nr/pibo/report/Data_Page/index.shtml)

Table 10. Big Wall Creek 7-day average daily maximum temperature, at the forest boundary, Lower Big Wall Creek subwatershed (170702020806)

Year	Temperature
1995	77
1996	68
1997	68
1998	77
1999	76
2000	74
2001	75
2002	74
2003	71
2004	77
2005	74
2006	74
2007	74
2008	72
2009	74
2010	74
2011	71
2012	75
2011	71
2012	75
2013	77
2014	75

Stream surveys from the early 1990s only qualified stream substrates (i.e. …substrate consisted of primarily cobble and sand) and did not perform Wolman pebble counts. In later stream surveys Wolman pebble counts were conducted in riffles and are intended to characterize substrate composition and percent fines throughout the bank full streambed. The Wolman pebble count protocol assesses substrate distribution between the bank full margins of the stream including outer margins of the streambed that are dry at low flow.

Substrate embeddedness is a highly subjective measurement and especially difficult to estimate in most of these stream reaches given the gradient, flow, geology and existing riparian condition of the majority of stream reaches in the analysis area; several stream reaches are in existing meadow complexes where the substrate percent fines are expected to be high. The majority of stream reaches within the analysis area have a dominant substrate of sand and cobble with some gravel.

Table 11 displays cattle access to perennial streams in the Tamarack allotment. Table 11 also describes how cattle are managed and use of fencing to protect spawning ESA listed MCR steelhead and redds and prevent direct effects.

Table 11. Summary of cattle access to perennial streams in the Tamarack allotment and use of fencing to protect spawning ESA listed MCR steelhead, redds and to prevent direct effects

Stream	HUC 6	Spawning	Designated Critical Habitat	Management Elements that Limit or Eliminate Cattle Interaction with Spawning MCR Steelhead or Access to Riparian Areas with DCH	Pasture
Big Wall Creek	Middle Big Wall	Yes	Yes	Approximately 2.5 miles of Wall Creek has been excluded from the Wild Horse pasture, called the Tamarack Lower Wall Creek Riparian Pasture. This pasture is typically not part of the annual grazing schedule and is rested. However, if this pasture was to be grazed it would be grazed after July 15th by not more than 25 head for less than 10 days. DMA	Tamarack Lower Wall Creek Riparian Pasture
South Fork Big Wall Creek	Middle Big Wall	Yes	Yes	Approximately 3 miles of stream has been fenced to exclude cattle from accessing MCR spawning and DCH for steelhead. Cattle are not authorized to graze this exclosure. DMA	Wildhorse Pasture
Dark Canyon	Middle Big Wall	Yes	Yes	The lower 1.2 miles of Dark Canyon creek have verified steelhead spawning. Approximately 2.1 miles is DCH for MCR steelhead. Spawning habitat above the FS 2300100 RD (~ river mile 1.2) not suitable given large embedded substrate and step pool habitat. Approximately 0.5 miles of the lower end of Dark Canyon from the confluence of Big Wall Creek has been fenced to exclude livestock from that portion of Dark Canyon Creek. The upper end of Dark Canyon Creek has limited access due to terrain and down wood. Grazed after July 15. DMA	Wildhorse Pasture
Lost Canyon Creek	Middle Big Wall	Yes	No	Approximately 1 mile of Lost Canyon Creek upstream from the confluence of Big Wall Creek has verified presence of MCR steelhead and spawning. Cattle access to the lower mile of stream on Lost Canyon Creek is limited due to terrain and downed wood. Grazed after July 15. DMA	Wildhorse Pasture
Tamarack Creek	Upper Kahler	No	No	Tamarack Creek within the allotment boundary is a snowmelt stream, and is intermittent with isolated pools by early to mid-May. There is no DCH and no documented spawning within the allotment boundary. There is a barrier culvert at Highway 207. Approximately .8 miles of Tamarack Creek from the allotment boundary has verified presence of redband. DMA	Stalling Butte Pasture

Direct/Indirect Effects

Direct and Indirect Effects Analysis

This section analyzes the direct and indirect effects of the proposed project on listed and non-listed native aquatic species and DCH. Direct effects are immediate impacts, both adverse and beneficial, from project-related actions. Indirect effects are caused by, or result from the proposed action and may occur later in time.

Impacts to fisheries and stream habitats associated with improperly grazed livestock have been well documented in scientific literature and by state and federal agencies (Case and Kauffman, Emmerich and Heitschmidt 2002, George et al. 2002, Kauffman and Krueger 1984; Clary and Webster 1990, Clary 1999, Platts 1991, Platts and Nelson 1985, Skinner 2003). Due to these potential impacts, guidelines have been developed for moving livestock through a pasture rotation established by easily measured indicators that deal directly with livestock effects on stream channels and riparian vegetation. Predicted effects are also based on past monitoring results. Implementation monitoring is used to ensure compliance with BMP's and assure Forest Plan stubble height and utilization standards are being met. As described in the monitoring section in the range specialist report and PIBO EM objectives, past results of monitoring utilization standards in riparian areas also support conclusions of effects of the proposed grazing project.

Successful management of allotments to protect or improve riparian areas depends, in part, on adequate forage away from riparian areas, effective riparian exclosures (Platts and Nelson 1989, Platts 1991), alternative water source development, and management of stock by permittees. In degraded riparian areas, it has been shown that stream conditions improved through commitment of livestock permittees and their riders, agencies, and the interested public (Bengeyfield 2006, Bayley and Li 2008). Range activities on the Tamarack Allotment are closely managed (fencing, 62 upland water developments, pasture rotation, salting and riding); thereby reducing the potential for impacts to ESA listed fish and their critical habitats and other aquatic species. This is due primarily but, not exclusively to, Best Management Practices (BMPs) (see EA for complete listing) and project specific design criteria applied uniformly across the project area, together with proposed conservation measures.

Based upon field reviews of the allotment and considering past studies (Spence et al. 1996 and Platts 1991), the primary potential impacts on the Tamarack Creek Allotment would be grazing near or on stream banks and removing and/or trampling associated vegetation along stream reaches that are not excluded from cattle use, and possibly chemical contaminants due to livestock waste.

Restricting cattle access to streams in some reaches until after July 15th, and fencing most spawning reaches, will limit direct effects to fish and prevent trampling of redds.

Alternative 1: No Grazing

Under Alternative 1 no grazing would be authorized. Improvements such as fences, gates, and pipelines would be removed unless identified as important for other resources needs such as wildlife. No grazing would eliminate all potential direct and indirect effects of livestock on stream habitat and water quality parameters in this allotment. There would be potential beneficial direct/indirect effects to ESA listed fish species, DCH and USFS R6 sensitive fish and aquatic invertebrates. The rate and magnitude of change in stream and riparian habitat condition due to no cattle grazing would vary depending on the streams current floodplain connectivity, substrate composition, stream flow, riparian vegetation composition, upstream sediment supply, and climate (USFS 2015). See hydrology report for additional effects analysis to physicial habitat indicators.

Temperature

Under the No Grazing Alternative approximately 5.7 miles of fish bearing streams will no longer be grazed by livestock. No grazing could result in a decrease in water temperature by increasing streamside vegetation that provides shade and by altering the shape of stream channels which decreases the surface area of a stream. Water temperature is partially a function of the amount of solar radiation reaching a stream channel and the amount of surface area. The quantity and vigor of plants that shade streams and influence water temperatures would improve due to the lack of browsing by livestock.

Sediment

No grazing may decrease the supply of fine sediment available for transport to streams. This may occur where 1) the recovery of compacted soils and the revegetation of bare areas is a result of no grazing; and 2) an increase in bank stability through the lack of mechanical damage to stream banks or increase in rooting strength of streambank stabilizing vegetation. Both of these may result in reduced erosion rates resulting in a reduction of fine sediment levels in streams.

See hydrology report for a complete discussion of effects of sediment and other physical characteristics under Alternative 1.

Chemical Contamination/Nutrients

Under the no grazing Alternative nutrient loading or chemical contamination entering the streams within the project area would remain unchanged or lower slightly. See hydrology report for a complete discussion of effects of chemical contaminants and nutrients under Alternative 1.

Disturbance from Grazing

Under the no grazing Alternative there would be no probability of disturbance to aquatic species from cattle grazing or any other activity associated with allotment management. There would be a very low probability of disturbance from removal of fences and other infrastructure.

Cumulative Effects

Effects to aquatic species would be reduced do to the overall reductions in ungulates on the landscape. However, elk and deer would have more unrestricted access to streams and could increase grazing in areas currently fenced off from cattle, including areas of spawning steelhead. Cumulative effects to physical parameters are described in the hydrology report.

Alternative 2: Current Management

- Alternative 2 would continue grazing with no added spring sources, or additional fencing. Alternative 2 is described in detail in the EA, including reauthorizing grazing (209 cow/calf pairs from 5/1 -9/15). Activities associated with cattle that could impact water quality and riparian areas include grazing, fence maintenance, including use of motorized equipment for maintenance of water sources. The type and magnitude of the direct and indirect effects is not expected to change as this alternative reflects current management.

Temperature

See hydrology report for complete discussion of effects to temperature. Water sources and salting methods in uplands help keep cattle away from streams and minimize impacts. Based on monitoring as described in the hydrology report, any reduction of shade beyond existing riparian vegetation is expected to be minor and insignificant.

Sediment

Livestock grazing can increase fine sediment levels in streams by increasing the supply of fine sediment available for transport. This can occur where 1) livestock grazing results in compacted soils and bare areas from overgrazing; and 2) livestock grazing results in decreased bank stability through mechanical damage to stream banks or reductions in rooting strength of streambank stabilizing vegetation. Both of these can result in an increase in erosion rates resulting in increases in fine sediment levels in streams.

Streams grazed after the July 15th restriction date are small, most are dry or intermittent with little flow to transport sediment. Riparian vegetation performs a number of vital functions that affect the quality of fish habitat. Vegetation increases allow roots to stabilize streambanks and stems and foliage to slow water velocities, trap fine sediments, provide over-cover for fish, provide shade that may aid in keeping stream temperature cool, and provides additional terrestrial invertebrate input important to fish diet during the summer months (Murphy and Meehan 1991, Saunders and Fausch 2010).

Umatilla NF LRMP has established maximum end of the season utilization standards for both riparian and upland vegetation conditions. Stubble height

and woody browse at Designated Monitoring Areas have consistently met end of season utilization standards on the allotment since 1998. Monitoring of streambank conditions conducted since 1993 and more current PIBO EM data (PIBO data analysis) demonstrate streambank stability has primarily been above 90% bank stability. Grazed riparian areas continue to meet grazing standards during post-grazing monitoring. Given this there would be low probability due to maintained functioning condition of riparian vegetation that sediment will be transported downstream.
Where livestock are allowed to graze along Class I and intermittent streams, use would be monitored to assure conditions are maintained at required use levels. Past monitoring demonstrates that cattle can graze these areas under current management protocols, and meet other resource objectives. See hydrology report for a complete discussion of effects of sediment and other physical characteristics and monitoring results.

Chemical Contamination/Nutrients

Nutrient loading or chemical contamination entering the streams within the project area would remain unchanged. See hydrology report for a complete discussion of effects of chemical contaminants and nutrients under Alternative 1.

Disturbance to Aquatic Species from Grazing

There are approximately 5.7 stream miles that are fish bearing and accessible to cattle on Tamarack Allotment. There are 1.3 of 3.7 miles of South Fork Big Wall Creek, and 3.25 of 3.75 miles of Dark Canyon Creek that are fish bearing and accessible to cattle. Spawning begins in these streams in mid-April to mid-May.
Grazing authorization occurs only after steelhead fry have emerged from redds. Direct impacts under this alternative would have some impacts to steelhead and resident fish fry when occupied fish areas overlap with cattle grazing. During summer months and low flow periods, approximately 62 upland water developments, fencing, terrain and riding and salting help keep cattle away from streams minimizing impacts to juvenile ESA listed and native fish populations In 2013, National Marine Fisheries Service concurred that effects to listed steelhead and their Designated Critical Habitat from ongoing grazing based on the management actions described for this alternative, would be small and immeasurable, validating Forest Service conclusions here for both redband and steelhead and for their habitats.

Cumulative Effects

Cumulative effects to aquatic species would be the same as current management. As described in the hydrology report, past activities and events in the planning area watersheds include timber harvest: other grazing allotments, elk, road construction, closures, improvements and decommissioning; wildfire and prescribed fire as well as recreational use including trails.

Wild ungulates would continue consuming upland and riparian vegetation; and walking through stream channels within the Tamarack allotment and as well as other allotments within the watershed. The impacts of elk currently numbering above historic levels would continue. Other cumulative effects described in the hydrology report, such as implementation of the Kahler project, which is ongoing, could have a negligible change to physical parameters potentially affecting aquatic resources. Because no measurable changes to habitat parameters directly attributable to livestock grazing, any cumulative effects to fish and other aquatic species from current grazing management to water quality, bank stability and other habitat parameters discussed, when added to existing conditions and ongoing projects such as Kahler project, would be at a very small level and not measureable as livestock management under this alternative is designed to allow for habitat restoration to continue through natural processes, at near-natural rates and is not expected to accelerate habitat restoration by means of natural processes.

The statement in the cumulative effects portion of the hydrology section does not suggest that the action alternatives proposed would have no effect to water quality, stream flows or sediment regimes that would affect sensitive or listed fish or sensitive aquatic invertebrates. These statements identify that the action alternatives combined with past, present and reasonably foreseeable effects at the watershed within the Tamarack Allotment would be small and difficult to measure. Livestock management (timing of grazing, intensity of grazing and duration of grazing while cattle are grazing on the allotment) along with existing upland water developments and proposed water developments, riparian fencing, mineral placement, and herding of livestock are deigned to distribute livestock grazing effects away from sensitive riparian areas where there are listed and or sensitive fish species and Designated Critical habitat (DCH).

Alternative 3: Proposed Action with Additional Fencing

Alternative 3 would allow the current management of the allotment which authorizes 209 cow/calf pairs from June 1st through September 15th with modifications. The modifications would increase the number of upland spring developments and include additional riparian fencing to Dark and Lost Canyon Creeks within the Wildhorse pasture.

Proposed actions under Alternative 3 have similar direct/indirect effects to ESA listed fish species, designated critical habitat and USFS Region 6 sensitive fish and aquatic invertebrates as analyzed under Alternative 2. Additional fencing would protect aquatic resources along Dark Canyon and Lost Canyon Creeks. Construction of fence line may have localized (a few square feet at each post hole) disturbance during construction. Replacement of fence line and upland spring development may have indirect beneficial effects to fisheries by further deterring cattle movement and transport through riparian areas.

See hydrology report for additional discussion of effects to physical parameters from fence construction and water developments.

Disturbance to Aquatic Species from Grazing

Effects to aquatic species would be similar to Alternative 2, although overall effects would be reduced because additional fencing would protect additional stream channels. Fence construction disturbance to aquatic species would be insignificant.

Cumulative Effects

Effects to aquatic species would be similar to Alternative 2, current management. As described in the hydrology report, past activities and events in the planning area watersheds include timber harvest: other grazing allotments, elk, road construction, closures, improvements and decommissioning; wildfire and prescribed fire as well as recreational use including trails.

Wild ungulates would continue consuming upland and riparian vegetation; and walking through stream channels within the Tamarack allotment and as well as other allotments within the watershed. The impacts of elk currently numbering above historic levels would continue. More stream segments would be protected because of additional fencing, and potential reduce impacts of wild ungulates. Other cumulative effects described in the hydrology report, such as implementation of the Kahler project, could have a negligible change to physical parameters potentially affecting aquatic resources. Any effect to fish and other aquatic species would be at a very small level and not measureable.

Summary of Environmental Effects

This section summarizes effects of the three alternative. Source information includes the hydrology report and 2013 Tamarack BA. Alternative 1 (No Grazing) would do the most to reduce cattle impacts to water quality and fish and aquatic species within the Tamarack allotment but does not meet the Purpose and Need of the project.

Alternative 3 provides more protection of riparian areas by fencing and development of upland water sources than Alternative 2. As described earlier, and due to fencing and topographic features displayed in Map 4 Table 11, there are no direct effects to ESA listed spawning steelhead and their redds. There may be effects after July 15, but effects to all aquatic species are minimal due to upland water sources and fencing on many miles of perennial streams. Alternative 3 provides more protection of riparian areas by fencing and placing upland water sources than Alternative 2 which reflects current management.

Forest Plan Consistency

The listed alternatives would be consistent with Forest Plan direction regarding native fish populations. None of the potential effects of allotment management under any of these alternatives would be expected to retard progress towards PACFISH Riparian Management Objectives or reduce steelhead/redband trout population viability.

Biological Evaluation and Determination of Effects

Mid-Columbia Steelhead and Designated Critical Habitat

Alternative 1

Under this alternative, direct, indirect and cumulative impacts to this species and its habitat from authorized livestock grazing in the Tamarack Allotment would be eliminated. In response to the elimination of livestock grazing, it is expected that certain riparian shrubs (i.e. young plants) would respond favorably. However, it is important to note that with current grazing management, the UNF is meeting stubble height and utilization standards. Light utilization standards (3% to 22%) have been consistently met. Considering this and cumulative effects, there is the possibility that the riparian vegetation and stream habitat response to no livestock grazing would not be measureable. Effects would be from removal of fences and increased access by wild ungulates to streams. Therefore, effects would not be measureable to Threatened MCR steelhead and DCH. Fence removal may require ESA Section 7 consultation with the NMFS.

Alternatives 2 and 3

Implementation of the Tamarack Allotment under the proposed action Alternatives **'may effect, but are not likely to adversely affect'** Mid-Columbia steelhead, or DCH. The overall direct, indirect effects of any of this project's action alternatives would result in negligible and discountable effects to MCR steelhead and their DCH at the project scale and thus at the forest scale. The project is consistent with the Forest Plan as amended by PACFISH; the project activity will not further affect viability of the NFJD River MCR steelhead population on the Umatilla National Forest. The Biological Assessment completed in 2013, and the subsequent Letter of Concurrence dated December 23, 2013 (reference WCR-2013-138) is consistent with Alternatives 2 and 3. This includes "Adaptive management using a combination of fencing riparian areas, upland water development…ensure there are no adverse effects to MCR steelhead and their DCH" (LOC p. 3). Under Alternative 3, fence construction is an authorized category in the ESA programmatic 2013 Aquatic Restoration Biological Opinion, and dependent on fence location, ESA Section 7 consultation could occur through this programmatic as needed.

Interior Redband Trout

Alternative 1

As described previously in response to the elimination of livestock grazing, it is expected that certain riparian shrubs (i.e. young plants) would respond favorably. Considering this and cumulative effects, there is the possibility that the riparian vegetation and stream habitat response to no grazing would be immeasurable. Therefore there would be ***negligible and discountable effects*** to Interior Redband Trout. Viability of this species will be maintained across the forest.

Alternatives 2 and 3

The overall direct, indirect and cumulative effects from Alternatives 2 and 3 would be ***negligible and discountable*** to Redband Trout. A negligible and discountable effect may occur in the project area and is expected to be immeasurable and insignificant at the Forest scale. Viability of this species will be maintained.

Sensitive Species

Effects to Sensitive fish species such as Pacific lamprey, and Sensitive aquatic invertebrates such as Western ridged mussel, Shortface lanx, and Columbia clubtail and their habitats would not be measureable under Alternative 1. There may be impacts to individuals, but viability of these species would be maintained across the forest.

Alternatives 2 and 3

The overall direct, indirect and cumulative effects from Alternatives 2 and 3 may impact individuals or habitat but is not likely to result in a trend toward federal listing, and continued viability is expected on the Umatilla NF. A negligible and discountable effect may occur in the project area but, are expected to be immeasurable and insignificant at the Forest scale.

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